ELEMENT OF GLOBE BLOCK GAME, AND METHODS OF MAKING AND USE THE SAME

FIELD OF THE INVENTION

This invention relates to element of block games applicable to build a portion of ball-like body, particularly to a set of elements suitable for creating a pre-determined portion of a hollow globe-like body or simulative celestial sphere.

BACKGROUND OF THE INVENTION

Play and learning is the most interesting way for most people, especially, through play that much of children's early learning is achieved.

Learning geography, especially on a global scale and referring to a world atlas that involves positioning by longitude and latitude system, and involves the exercise of a great deal of spatial imagination, often in three dimensions. The ability to use this kind of imagination is usually crude in the very young and must be slowly nurtured and developed during the educational process. Moreover, in the early stages of the development of the necessary skills, different children utilize different learning modalities. Even the same child at different levels of development may use different learning modes.

To this end, educators have developed a number of visually or tactually stimulating models of geographical phenomena, such as relief maps and variations of the well known terrestrial globe. Many of these devices are suitable for a form of programmed teaching in which a terrestrial globe is built up piece by piece from a large number of separate parts in the form of a kit. An example of such a device is disclosed in U.S. Pat. No. 4,797,102

issued to Forsyth, illustrated a globe-shaped body built from a skeletal framework to hold a number of blocks, the blocks together forming a spherical surface. Appropriate portions of geographical features, or portions of cues, are formed on the blocks. A number of means has shown in the patent for attaching the blocks to the framework and the segments to the body. Forsyth's patent has shown a series of embodiments to teach geography to student; however it has fall short of the ideal teaching of the relation of longitude and latitude ofwhich is a basic information shown on most of the world atlas.

Others, such as Margolis in U.S. Pat. No. 5,441,261 discloses a globe, comprising a hollow globe rotationally molded of polyvinyl chloride plastisol and iron powder having molded therein embossed lines of latitude and longitude and other information as desired. The rest of the geographic information of the globe is embodied in several layers of puzzle-like pieces of soft, flexible magnetized thermoplastic material. However, such globe can be assembled only by a person already familiar with terrestrial geography, and lacks for offering any assistance to the untutored student who is working or playing alone. Further, the means used to attach component parts to these globes have tended to be either unreliable or overly complicated for a young person whose hand/eye coordination is not fully developed.

In general, the prior globe body cannot be assembled as in form of a block game, and further, none of the prior globe structure is capable of providing the most interesting portion ofwhich is selected by its owner.

Larger size globe is much helpful and capable of carrying a tremendous geographic information for helping people to learn geography thereby; however, any of the big size traditional globe structures is always very difficult to manufacture and deliver, that is the main cause of the selling

price getting higher and may be unaffordable for an ordinary people or middle class family.

For instance, I ever found at http://www.globe-shop.net, a web-site of Japanese Shop who is providing their biggest and highest class globe, having **81** cm in diameter, and weighted up to **68** kg, and quoted an amazing price, that is **1,659,000** yen.

Neither these, nor any other in the field of this invention, suggests their globe structure to be assembled as block game, and is selectable to provide the most interesting portion which can be determined by an owner.

SUMMARY OF THE INVENTION

The object of this invention is to provide a set of elements of block games for stacking up to create a pre-determined portion of a hollow globe-like body or a simulative celestial sphere.

In accordance with this invention, the element has a relatively larger outer face boundary and a relatively small inner face boundary both are defined by the interfaces therearound. The surface within the relatively larger outer face boundary or the relatively small inner face boundary, can further be processed by a known printing, engraving, embossing, gluing, laser carving, sand blasting, colored painting or chemical etching method, for creating a known or imaginary geographic information, star chart or picture thereon.

In an embodiment according to the present invention, the element have an interface defined along a longitude and latitude lines with a predetermined dividing (N°), therefore, when the element stacked up, the

interface therebetween shall shown as the longitude and latitude lines of the globe-like body surface.

The surface within the relatively larger outer face boundary having a longitude edge (**H1**) and a latitude edge (**L1s**) at a latitude that equals to the predetermined dividing (**N°**) multiplied by a predetermined number (**S**), that can be determined by:

$$H1 = (2\pi R)(N°) \div (360°); \text{ and}$$

$$L1s = (2\pi)(R)(\text{cosine}(N° \cdot S))(N°) \div (360°);$$

and The surface within the relatively smaller inner face boundary also having a longitude edge (**H2**) and a latitude edge (**L2s**) at a latitude that equals to the predetermined dividing (**N°**) multiplied by a predetermined number (**S**), that can be determined by:

$$H2 = (2\pi)(R\text{-}T0)(N°) \div (360°); \text{ and}$$

$$L2s = (2\pi)(R\text{-}T0)(\text{cosine}(N° \cdot S))(N°) \div (360°).$$

In another embodiment according to this invention, the element having interfaces defining along with a set of regular pattern on the globe-like body, therefore each of the elements having a relatively larger outer face and relatively small inner face, and a plurality of geographic information or pictures is printed or attached thereon.

The element can either be a solid body or a shell-like body, and made from any of moldable materials, such as paraffin, candle, chocolate, styrofoam, paper pulp, concrete, acrylic, plastic, porcelain, clay; or any other cuttable material such as stone, crystal, glass, wooden, metal sheet, cloth, or paper, or any possible combination of the above materials, which are exemplified in the following detailed disclosure.

Other objects of the invention will in part be obvious and will in part appear hereinafter. The scope of the invention will be indicated in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and objects of the invention, references should be had to the following detail description, taken in connection with the accompanying drawings, in which:

FIG. 1 is an exploded perspective view for illustrating a set of the element in accordance with this invention;

FIG. 2 is a perspective view for illustrating the use of an elements in accordance with this invention; once pressed it on outside, the pressing force shall be shared and transmitted to another elements via the interfaces therearound, same as the way of traditional arch principle; however, in this invention, it is transmitted in a three dimensional way;

FIG. 3 is a perspective view showing an elements in accordance with this invention creating a portion of a hollow globe-like body;

FIG. 4 is a perspective view showing an elements in accordance with this invention creating another portion of a hollow globe-like body;

FIG. 5 is a perspective view showing a set of the element in accordance with this invention, wherein the interfaces of the element is defined along with a longitude and latitude lines which having a predetermined dividing of 15°;

FIG. 6 is a perspective view showing an elements in accordance with this invention creating a portion of a hollow globe-like body, in which having an inner face for celestial pictures be printed or attached thereon;

FIG. 7 is a perspective view showing an element in accordance with this invention that using to build a portion of a globe-like surface on a table;

FIG. 8 is a perspective view showing an element in accordance with this invention that is using to combine with on a book shelf;

FIG. 9 is a perspective view showing an element in accordance with this invention having a pair of male/female connector formed on its interfaces;

FIG. 10 is a perspective view showing an element in accordance with this invention having magnetic coupling element disposed on its interfaces;

FIG. 11 is a perspective view showing an element in accordance with this invention having a shell-like body;

FIG. 12 is a perspective view showing an element in accordance with this invention having a carton-like body that is expandable as shown;

FIG. 13 is a perspective view showing an element in accordance with this invention that having a magnetic portion on its outer face;

FIG. 14 is a perspective view showing an element in accordance with this invention further having a transparent layer on the outer face;

FIG. 15 is a perspective view showing an element in accordance with this invention that are stacked up on an equatorial ring and created a portion of a globe-like body;

FIG. 16 is a perspective view showing another embodiment of elements in accordance with the present invention, each having an interfaces to follow a regular pattern and define a larger outer face and smaller inner face therebetween;

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to **FIG. 1**, in accordance with the present invention, an

embodiment of a set of elements (**S1**) for play and stacking up to create a portion of a hollow globe-like body, each element (**10**) having a larger surface (**11**) within a relatively larger outer face boundary and a smaller surface (**12**) within a relatively smaller inner face boundary both are defined by a plurality of interfaces (**13, 14, 15** and **16**) therearound.

Referring to **FIG. 2**, while the portion of a hollow globe-like body (**20**) is stacked up by the elements (**10**), and even a force is applying thereon, the force shall be transmitted and shared by another elements (**10**), and acted as a three dimensional arch. There are no prior art that is possessing a globe-like body utilizing the same principle of 3-D arch, and is capable of stacking up like a

Referring to **FIGS. 3** and **4**, according to the present invention, the embodiment of the element (**10**) each having a larger surface (**11**) within a relatively larger outer face boundary for printing or attaching a portion of a geography information or pictures (**31**) thereon, and a smaller surface (**12**) within a relatively smaller inner face boundary for printing or attaching a portion of celestial picture thereon. The larger surface (**11**) and smaller surface (**12**) is defined by the interfaces (**13, 14, 15** and **16**) which is following a predetermined longitude and latitude lines on the globe-like body (**20**), so it is capable of forming a plurality of longitude and latitude lines automatically on the surface of globe-like body (**20**) while stacking up in a block games.

In accordance with this invention, The predetermined longitude and latitude lines having a predetermined dividing (**N°**), the relatively larger outer face boundary having a longitude edge (**H1**) and a latitude edge (**L1s**) at a latitude that equals to the predetermined dividing (**N°**) multiplied by a predetermined number (**S**), that can be determined by:

H1 = (2 π **R**) (**N°**) ÷ (**360°**); and

L1s = (2 π)(**R**)(**cosine** (**N°** • **S**)) (**N°**) ÷ (**360°**);

and the relatively smaller inner face boundary also having a longitude edge (**H2**) and a latitude edge(**L2s**) at a latitude that equals to the predetermined dividing (**N°**) multiplied by a predetermined number (**S**), that can be determined by:

H2 = (2 π)(**R-T0**) (**N°**) ÷ (**360°**); and

L2s = (2 π)(**R-T0**)(**cosine** (**N°** • **S**)) (**N°**) ÷ (**360°**).

For instance, referring to **FIG. 5**, the longitude and latitude lines having a predetermined dividing of **15°**, the longitude edge length of the relatively larger outer face boundary can be determined by the following formulae:

(**H1**) ≒ (2π**R**) (**15°** ÷ **360°**);

(**H2**) ≒ (2 π) (**R-T0**) (**15°** ÷ **360°**); and

at the latitude **0°**, set (**S**) = **0**, the latitude edge (**L1s**) shall be (**L10**), which can be determined by:

(**L10**) ≒ (2 π **R**)(**cosine**(**0** • **15°**))(**15°**÷**360°**)

≒ (2 π **R**)(**1**÷**24**);

at the latitude **15°**, set (**S**) = **1**, the latitude edge (**L11**) shall be determined by:

(**L11**) ≒ (2 π **R**)(**cosine**(**1** • **15°**))(**15°**÷**360°**)

≒ (2 π **R**)(**cosine**(**15°**)÷(**24**)

at the latitude **30°**, set (**S**) = **2**, the latitude edge (**L12**) shall be determined by:

(**L12**) ≒ (2 π **R**)(**cosine**(**2** • **15°**))(**15°**÷**360°**)

$$\fallingdotseq (2\pi R)(\text{cosine}(30°) \div (24)$$

at the latitude **45°**, set **(S) = 3**, the latitude edge **(L13)** shall be determined by:

$$(L13) \fallingdotseq (2\pi R)(\text{cosine}(3 \cdot 15°))(15° \div 360°)$$
$$\fallingdotseq (2\pi R)(\text{cosine}(45°) \div (24)$$

at the latitude **60°**, set **(S) = 4**, the latitude edge **(L14)** shall be determined by:

$$(L14) \fallingdotseq (2\pi R)(\text{cosine}(4 \cdot 15°))(15° \div 360°)$$
$$\fallingdotseq (2\pi R)(\text{cosine}(60°) \div (24)$$

at the latitude **75°**, set **(S) = 5**, the latitude edge **(L15)** shall be determined by:

$$(L15) \fallingdotseq (2\pi R)(\text{cosine}(5 \cdot 15°))(15° \div 360°)$$
$$\fallingdotseq (2\pi R)(\text{cosine}(75°) \div (24)$$

at the latitude **90°**, set **(S) = 6**, the latitude edge **(L16)** shall be determined by:

$$(L16) \fallingdotseq (2\pi R)(\text{cosine}(6 \cdot 15°))(15° \div 360°)$$
$$\fallingdotseq (2\pi R)(\text{cosine}(90°) \div (24)$$
$$\fallingdotseq 0$$

and, the latitude edge **(L2s)** of the relatively smaller inner face boundary can be determined by the following formulae:

at the latitude **0°**, set **(S) = 0**, the latitude edge **(L2s)** shall be **(L20)**, and determined by:

$$(L20) \fallingdotseq (2\pi)(R\text{-}T0)(\text{cosine}(0 \cdot 15°))(15° \div 360°)$$

$$\fallingdotseq (2\pi)(\mathbf{R\text{-}T0})\div(24)$$

at the latitude **15°**, set **(S) = 1**, the latitude edge **(L21)** shall be determined by:

$$(\mathbf{L21}) \fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(1 \cdot 15°))(15°\div 360°)$$

$$\fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(15°)\div(24)$$

at the latitude **30°**, set **(S) = 2**, the latitude edge **(L22)** shall be determined by:

$$(\mathbf{L22}) \fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(2 \cdot 15°))(15°\div 360°)$$

$$\fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(30°)\div(24)$$

at the latitude **45°**, set **(S) = 3**, the latitude edge **(L23)** shall be determined by:

$$(\mathbf{L23}) \fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(3 \cdot 15°))(15°\div 360°)$$

$$\fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(45°)\div(24)$$

at the latitude **60°**, set **(S) = 4**, the latitude edge **(L24)** shall be determined by:

$$(\mathbf{L24}) \fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(4 \cdot 15°))(15°\div 360°)$$

$$\fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(60°)\div(24)$$

at the latitude **75°**, set **(S) = 5**, the latitude edge **(L25)** shall be determined by:

$$(\mathbf{L25}) \fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(5 \cdot 15°))(15°\div 360°)$$

$$\fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(75°)\div(24)$$

at the latitude **90°**, set **(S) = 6**, the latitude edge **(L26)** shall be

determined by:

$$(\mathbf{L26}) \fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(6 \cdot 15°))(15° \div 360°)$$

$$\fallingdotseq (2\pi)(\mathbf{R\text{-}T0})(\mathbf{cosine}(90°) \div (24)$$

$$\fallingdotseq \mathbf{0}$$

According to the formulae, to create a portion of an **100** cm globe, needs only **48** sets of the elements (**S1**) ; the largest edge or the first latitude edge (**L10**), is only **13.09** cm.

Alternatively, when interfaces (**13**, **14**, **15** and **16**) are defining along with the longitude and latitude lines with a predetermined dividing 10°, the total would needs only **72** sets of the elements (**10**), and each set of the element (**S1**) would having **9** pieces of the element (**10**), wherein the largest edge of the element (**10**) would be **8.727** cm only. Thus, to compare with the traditional globe structure, this invention is much helpful to reduce the packing size and can lower the freight cost; and more interestingly allowing to play and learning geography knowledge in its block games.

The elements (**10**) of block games according to this invention, can be made from any of moldable materials; for instance, there are paraffin, candle, chocolate, Styrofoam, paper pulp, concrete, acrylic, plastic, porcelain, clay; or any other solid cuttable material such as stone, crystal, glass, wooden, metal, cloth, or paper, or any possible combination of the above materials, which are exemplified in the following detailed disclosure.

Referring to **FIG. 6**, an embodiment of the elements (**10**) in accordance with this invention is capable of creating a portion of a hollow globe-like body, having an smaller surface (**12**) for presenting a known or imaginary celestial pictures (**32**) by a known printing, engraving, embossing, gluing, laser carving, sand blasting, colored painting or chemical etching

method, for creating a known or imaginary geographic information, star chart or picture thereon.

Further referring to **FIG. 7**, the embodiment of the elements (**10**) in accordance with this invention are capable of creating a portion of a globe-like body (**20**) combined with a game table or board, and providing a surface for attaching some extra geographic items (**33**) thereon. **FIG. 8** further showing a plurality of set of the elements (**S1**) in accordance with this invention are combined with a portion of a book shelves (**40**) for holding the books (**41**) therebetween.

For adding a connective force in either longitude or latitude directions, the interfaces (**13**, **14**, **15** and **16**) can further have connectors selectively disposed thereon. For example, please refer to **FIG. 9**, there is a perspective view showing an element in accordance with this invention having a part of male/female connectors (**17** and **18**) formed on the interfaces (**13**, **14**, **15** and **16**). Referring to **FIG. 10**, there is a perspective view showing an element (**10**) in accordance with this invention having a part of a known magnetic coupling elements (**19**) disposed on its interfaces (**13**, **14**, **15** and **16**).

For saving material and weight for the element (**10**), it can be made as a hollow body. Please refer to **FIG. 11**, there is a perspective view showing an embodiment of the element (**10**) in accordance with this invention the having a shell-like body with interfaces (**13**, **14**, **15** and **16**) defining a relatively larger outer face boundary and a relatively smaller inner face boundary. Moreover, we can make a paper or plastic carton with some flips (**f1**, **f2**, **f3**, **f4**, **f5**, **f6** and **f7**) for glue disposing thereon, having interfaces (**13**, **14**, **15** and **16**) and larger surface (**11**) within the relatively larger outer face boundary and smaller surface (**12**) within the relatively smaller inner face as shown on **FIG.12**. The length of edges (**H1**, **H2**, **L11**, **L12**, **L21**, **L22** and **T0**)

can be determined by the formulae as we have discussed in **FIG.5**.

For capable of presenting more information on the larger surface (**11**), a connector including but not limited to a magnetic portion (**34**) can be attached thereon, as shown in **FIG. 13**. In order to contain more information and protect the relatively the larger surface (**11**) of the element (**10**), a transparent layer (**35**) further can be covered onto it, as shown in **FIG. 14**.

For supporting the set of elements (**S2**) in accordance with this invention, **FIG. 15** is shown an equatorial ring (**50**) having latitude information thereon, that helps the elements (**10**) be correctly stacked up to create a portion of a globe-like body (**20**).

Another embodiment in accordance with this invention, having a set of interfaces (**13**, **14**, **15**, and **16**) following a set regulative pattern on the globe-like body, that is defining a set of elements as shown in **FIG. 16**. A larger surface (**11**) and smaller surfaces (**12**) is defined therebetween.

While the preferred embodiments of the invention have been described above, it will be recognized and understood that various modifications may be made therein and the appended claims are intended to cover all such modifications which may fall within the spirit and scope of the invention.

PARTS LIST

S1	a set of elements
S2	a set of elements
10	element
11	larger surface
12	smaller surface
13	interface

14	interface
15	interface
16	interface
17, 18	a part of male/female connectors
19	a part of a known magnetic coupling elements
20	a globe-like body
31	a geography information or pictures
32	Celestial pictures
33	extra geographic items
34	a magnetic portion
35	a transparent layer
40	bookshelf
41	book
50	an equatorial ring
H1	longitude edge
H2	longitude edge
L1s	latitude edge
L2s	latitude edge
L10	latitude edge at latitude 0°
L11	latitude edge at latitude15°
L12	latitude edge at latitude 30°
L13	latitude edge at latitude 45°
L14	latitude edge at latitude 60°
L15	latitude edge at latitude 75°
L16	latitude edge at latitude 90°
L20	latitude edge at latitude 0°
L21	latitude edge at latitude 15°

L22 latitude edge at latitude 30°

L23 latitude edge at latitude 45°

L24 latitude edge at latitude 60°

L25 latitude edge at latitude 75°

L26 latitude edge at latitude 90°

N° predetermined dividing of the longitude and latitude

R stands for the radius of the globe-like body

T0 stands for the predetermined thickness of the globe-like body